

*individuality* in plants, and the advocacy of the claim of the *bud* to the dignity of the 'vegetable individual.' So far as inquiries of this sort tend to direct attention to the physiological laws ruling the growth and multiplication of plants, they are beneficial; but as regards the main question it appears to us only a metaphysical puzzle, calculated to afford much amusement to those whose taste lies that way, but having no practical bearing. The meaning of the word 'individual' must always depend on foregone conclusions. It seems to us that the author is not clear in distinguishing *potentiality* from *actuality*. When a botanist speaks of the annual layers of wood of the stems of Dicotyledons as 'roots,' the term can only be admitted in a figurative sense. A bud may be *capable* of producing a distinct tree, but if it be not detached, it becomes an *individual branch*, not an *individual tree*. Our author does not appear to be aware, either, that roots as well as stems originate in definitely organized 'buds,' formed in the cambium region. The work is agreeably written, and its perusal may serve as a pleasant intellectual exercise, but it must not be accepted by any means as a full exposition of the question.

## PROCEEDINGS OF LEARNED SOCIETIES.

### ZOOLOGICAL SOCIETY.

July 10, 1855.—John Gould, Esq., F.R.S., in the Chair.

#### ON THE GEOGRAPHICAL DISTRIBUTION OF THE MAMMALIA AND BIRDS OF THE HIMALAYA.

By B. H. HODGSON, ESQ.\*

"The Himálayan mountains extend from the great bend of the Indus to the great bend of the Brahmapútra, or from Gilgit to Brahma Kúnd, between which their length is 1800 miles. Their mean breadth is about 90 miles; the maximum about 110, and the minimum 70 miles. The mean breadth of 90 miles may be most conveniently divided into three equal portions, each of which will therefore have 30 miles of extent. These transverse climatic divisions must be, of course, more or less arbitrary, and a microscopic vision would be disposed to increase them considerably beyond three, with reference to geological, to botanical, or to zoological phænomena. But, upon comparing Captain Herbert's distribution of geological phænomena with my own of zoological, and Dr. Hooker's of botanical, I am satisfied that three are enough. These regions I have denominated the lower, the middle, and the upper. They extend from the external margin of the Tarai to the ghát line of the snows. The lower region may be conveniently divided into—I. The sandstone range, with its contained Dhúns or Máris; II. The Bháver or Saul forest; III. The Tarai. The other two regions require no

\* Extracted from a memoir by the same author, entitled, "On the Physical Geography of the Himalaya," and printed in the Journal As. Soc. Bengal for 1849, by Frederic Moore.

subdivisions. The following appear to be those demarcations by height which most fitly indicate the three regions:—

Name.	Elevational limits.
Lower region .....	Level of the plains to 4000 feet above the sea.
Central region.....	4000 to 10,000 feet above the sea.
Upper region .....	10,000 to 16,000* feet above the sea: highest peak measured is 28,176.

“To begin with Man, the upper region is the exclusive habit of the Bhótias, who extend along the whole line of the gháts, and who, with the name, have retained the lingual and physical characteristics of their tramontane brethren. To the central region are confined—but each in their own province from east to west—the Mishmis, the Bors and Abors, the Ákás, the Daphlas, the Lhópás, the Lepchas, the Limbús, the Kirántis, the Múrmis, the Névárs, the Súnwárs, the Chépángs, the Gúrúngs, the Magars, the Khas or Khasias, the Kóhlis, the Garhwális, the Kakkas, the Bambas, the Gakars, the Khatirs, the Awans, and the Janjúhs. To the lower region are as exclusively limited the Kóceh, the Bódó, the Dhimál, the Kichak, the Thárú, the Dénwár, the Sallah, and the Bóksar. Of these races, those of the central region are all of transnivean origin, like the first named; but they are much altered in speech and aspect by twelve to fifteen centuries of residence in a cislivean climate, and by mixture in some few cases (as Khas or Khasia) with southern blood; whilst the races of the lower region are of the aboriginal Indian or Tamulian stock, and nearly unmixed, though some of them have adopted the speech and customs of the Hindust. The hill Bráhmans, Rájputés and Moslems, so common to the westward, so rare to the eastward, are more modern immigrants from the plains. It is very deserving of special notice, that the people of the upper region cannot endure the climate of the central one, nor those of the central region the climate of the lower one; so that the distribution even of the human race in the Himálaya affords a remarkable verification of our triple transverse division from a quarter the least likely to afford any such argument. But to proceed to our zoological enumerations. To the upper region exclusively belong, among the Ruminants, the Bisons (*Poëphagus*) and Musks, the Wild Goats (*Ibex*, *Hemitragus*) and Wild Sheep (*Pseudois*, *Ovis*); among the Rodents, the Marmots and Pikas (*Lagomys*); among Plantigrades, the Bears proper (*Ursus*). In the middle region, true Bovines (*Bos*) take the place of the Bisons of the upper region; Caprine Antelopes (*Nemorhædus*, *Kemas*) replace its Musks and Wild Goats and Sheep; common Rats, and Mice, and Hares, and Porcupines, and Hedgehogs, its Marmots and Pikas; and Sun Bears (*Helarctos*) its true Bears; whilst the Deer family, unknown to the upper region, is here

\* This is about the average height of the gháts and of the perpetual snow. It is also nearly the limit of possible investigation, and of the existence of organic phenomena.

† For these tribes see Journ. As. Soc. Beng. for December 1847, and April and June 1848, and May 1849.

represented only\* by the anomalous Stilt-horns (*Stylocerus*). In the lower region, the Ox family is represented by *Bibos* and *Bubalus* (splendid wild types); the Deer family, here abundant, by *Rusas*, Stags, *Axises*, and Stilt-horns to boot; the Antelopes by *Tetracerus*, or the four-horned kind; the Rodents, by the *Bambú Rats* (*Rhizomys*) and Spiny Hares (*Caprolagus*); and the Bear family by the Honey Bears (*Melursus*); add to all which, that to this region are exclusively confined all the large Pachyderms, such as the Elephant and Rhinoceros; and the Monkeys also (*Semnopithecus* et *Macacus*), though not so exclusively in their case. The Carnivora, again, are represented in the upper region by Ounces, by Foxes of a large sort (*V. montanus*), by the Weasels proper, and by the *Ailuri* or Cat Lories; in the middle region, by the Wild Dogs (*Cuon*), the Marten Weasels, Leopards, Thick-tailed Leopards (*F. Macrosceloides*, *Hodgs.*), Wild Cats (*F. Murmensis*, *Pardochrous Ogilbii*), Libyan Lynxes (*Libycus*), Zibets, Screw-tails (*Paradoxurus*), and Prionodons; and in the lower region by Tigers, Leopards, Hyænas, Wolves, Jackals†, insectivorous Foxes (*Kokri*), Bear-badgers (*Ursitaxus*), *Urvas*, Mongooses, Helictes or Oriental Gluttons, small Civets (*Viverrula*), hirsute Screw-tails, and sharp-faced Cats (*Celidogaster*). Zibets recur in this region but rarely, and one small species of Mongoose is found in special spots of the central region. The Otters in the upper region are represented by the small golden and brown species (*L. aurobrunnea*); in the central, by *L. monticola* and *indigitata*; in the lower, by the large Chinese species *L. Sinensis*. Among the Squirrels, the great thick-tailed and purple species (*S. macruroides* et *purpureus*) belong solely to the lower region; the small Lokries (*S. Lokria* et *Lokroides*) to the central, and the Siberian to the upper; whilst Flying Squirrels, a numerous group, are confined to the central region, so far as appears. In the Bat group, the Frugivorous species, or Pteropines, all are limited to the lower region, whilst the Horse-shoes (*Rhinolophinae*) specially affect the central region.

“From the class of Birds we may select as characteristic of the three regions the following:—

“The True Pheasants (*Phasianus*), the Tetraogalli, the Sanguine Pheasants (*Ithaginis*), the Horned and the Crested Pheasants (*Cerionnis*, *Lophophorus*) of the upper region, are replaced by Fowl Pheasants (*Gallophasis*)‡ in the mid-region, and by Fowls proper (*Gallus*)

\* I am fully aware that *Rusas* (Sámber) are found in the western hills, but a careful consideration of the facts in that part of the Himalaya, with due advertence to the known habits of the group, satisfies me that these Deer have been driven into the western hills by the clearance of the Tarai and Bháver.

† Jackals have made their way (like crows) to the most populous spots of the central region, but they are not proper to the region, nor Indian Foxes, though some of the latter turned out by me in 1827 in the great valley of Nepal, have multiplied and settled their race there. *Ex his disce alia*.

‡ The influence of longitude on geographic distribution might be singularly illustrated, did space permit, from numerous Hímalayan groups, Galline and others; thus, for example, a black-breasted *Cerionnis* is never seen east of the Káfi, nor a red-breasted one west of it. So of the black and white crested *Gallophasis*; whilst a black-backed one is never seen west of the Arún, nor a white back east of it.

in the lower. In like manner, among the Partridges (*Perdicinæ*), the Grouse Partridges (*Tetraoperdix*) belong exclusively to the upper region; the Chukórs (*Caccabis*) and the Tree Partridges (*Arboricola*) to the central; and the Francolines (*Francolinus*) to the lower, though the black species of this last form are also found in the mid-region. In the Pigeon group, the Blanched Pigeons (*C. leuconota*) belong solely to the upper region; the Vinous Pigeons (*C. Hodgsoni*) to the central, and the Green, the Golden, and the Banded (*Treron*, *Chalcophaps*, *Macropygia*), as entirely to the lower; the Trerons alone partially entering the central tract from the lower.

The splendid Edolian Shrikes (*Chibia*, *Chaptia*, *Edolius*) belong exclusively to the lower region. They are replaced in the central tract by plain Dierurines, and in the upper by plainer Lanians. The Cotton Birds (*Campephaga*) of the south are replaced by gaudy Ampelines (*Cochoa*) and Leiothricinians (*Leiothrix*, *Pteruthius*, *Cutia*) in the middle region: but both groups seem excluded from the north. Among the Fly-catchers the gaudy or remarkable species and forms belong wholly or chiefly to the lower region, as *Tchitrea*, *Rhipidura*, *Cryptolopha*, *Myiagra*, *Hemichelidon*, *Chelidorynx*; whilst those which approach the Warblers (*Niltava*, *Siphia*, *Digenea*) belong to the mid-region; and the plainer and more European types are alone found in the northern.

Among the *Fissirostres*, Goat-suckers and Swallows are pretty generally distributed; but Rollers, Bee-eaters, Eurylaimi, Trogons, and all such gaudy types, belong to the south, with only occasional alpine representatives, as *Bucia* is of *Merops*. The Tenuirostral birds belong distinctively to the lower region. Yet they have representatives or summer visitants in all three, even among the Sun-birds. Upon the whole, however, it may be safely said that the Sun-birds (*Nectarinia*) belong to the south; the Honey-suckers (*Meliphagidæ*) to the centre and south; and the Creepers, Nut-hatches and Wrens\*, to the north and centre. The Sylvians or Warblers are too ubiquitous, or too migratory for our present purpose, even Boreal types being common in the lower in the cold weather. Horn-bills, Barbets, Parroquets (*Palæornis*, *Psittacula*) belong to the lower region, though they have a few representatives in the central; none in the upper. Woodpeckers abound in the lower and central regions, but are rare in the upper. True Cuckoos (*Cuculus*) are as common and numerous in the central region as Walking Cuckoos (*Phænicophaus*, *Centropus*), &c. are in the southern, where also the Golden (*Chrysococcyx*) and Dierurine Cuckoos (*Pseudornis*) have their sole abode, whilst what few of the group belong to the upper region, are all allied to the European type. The Ravens, Pies, Choughs, Nut-crackers and Conostomes of the upper region are replaced in the central region by Tree Pies (*Cissa*, *Dendrocitta*), Jays, Rocket-birds (*Psilorhinus*), Pie Thrushes (*Garrulax*), Timalias, and

\* I have in this paper followed, without entirely approving, Mr. G. R. Gray's classification of my collections in the printed Catalogue of the British Museum. The geographic distribution is now attempted for the first time. But I will recur to the subject in a separate paper devoted to it.

Hoopoe Thrushes (*Pomatorhinus*); and in the lower region, by the common Indian Crows (*C. culminatus* et *splendens*), Grackles\*, Stares, Vagabond Pies and Dirt-birds (*Malacoereus*). Thrushes proper with Rock Thrushes, Ousels, Myophones, Zootheres, Tesias and Hypsipetes are as abundant in the central and upper region as Bulbuls, Orioles, Pittas, are in the central and lower.

“In the Finch family, the Haw-finches, Bull-finches, Gold-finches, and Cross-bills (*Loxia*) are as strictly confined to the upper regions as are the corvine Conostomes, Nut-crackers, Choughs and Ravens. The former are replaced in the central region by the Buntings, Wood-finches (*Montifringilla*), and Siskins; and in the lower region by the Weavers and Mánias. The Raptorial birds are, in general, too cosmopolitan to subserve the purposes of geographic distribution. Still it may be remarked that the True Eagles belong, *quoad* breeding at least, to the upper region; the Crested Eagles (*Circaetus*), the Neopuses and Hawk Eagles (*Spizaetus*) to the central; and the Pernes (*Haliaetus* et *Pandion*) and Haliasturs to the lower. Among the Vultures the distinction is more marked: for the Eagle Vultures (*Gypaetus*) belong exclusively to the upper region; the large European Vultures (*fulvus* et *cinereus*) to the central; and the Neophrons and the small Indian Vultures (*Bengalensis* et *tenuirostris*) to the lower. The Himálaya abounds in *Falconidæ*, all the occidental types and species being found there, and many more peculiar and oriental ones; and it deserves special remark, that whereas the former (*Imperialis*, *Chrysaetos*, *Lanarius*, *Peregrinus*, *Palumbarius*, *Nisus*, &c.) affect the upper and central regions, the oriental types (*Hypotriorchis*, *Haliastur*, *Hierax*, *Hyptiopus*, *Elanus*, *Poliornis*) are quite confined to the lower region.

“Those perfect cosmopolitans the Waders and Swimmers, migrate regularly in April and October, between the plains of India and Tibet, and, in general, may be said to be wanting in the mountains, though most abundant in the Tarai. The great Herons (*nobilis* et *cinereus*), the great Storks (*nigra* et *purpurea*) and great Cranes (the Cyrus and Damoiselle) of the Tarai are never seen in the mountains, where the Egrets alone represent the first group. But the soft-billed smaller Waders (*Scolopacidæ*) are sufficiently common in the mountains, in which the Woodcock abounds, breeding in the upper region and frequenting the central, and rarely the lower region, from October till April. Geese, Ducks and Teals swarm in the Tarai, where every occidental type (so to speak, for they are ubiquitous) may be seen from October till April; and many oriental non-migratory types; whereas in the mountains the Mergansers (*orientalis*) and the Cormorants (*sinensis* et *pygmaeus*) only are found, and that very scantily, with a few Rails and Gallinules and Sandpipers from the vast host of the Waders.”

\* When Darjeeling was established there was not a Crow or Pastor to be seen. Now there are a few Crows, but no Pastors. Enormously abundant as both are in the lower region, this sufficiently proves that they are not native to the central tract, though common in the great valley of Nepal.

ON NATIVE IMPRESSIONS REGARDING THE NATURAL HISTORY  
OF CERTAIN [INDIAN] ANIMALS.

BY H. TORRENS, ESQ., B.A., V.P. AS. SOC. BENGAL\*.

The singular impressions current among natives, even of the highest rank, as to the habits and nature of certain animals, are not undeserving of record. It is rarely that the credence of the narrators in these things can be elicited, if even they go so far as to mention the existence of the belief; for they dread the ridicule as much as they anticipate the incredulity of a European: consequently these strange stories are but imperfectly known, even to the best informed among us in such legends. I mention one or two, with the circumstances of my acquaintance with them.

While out tiger-shooting with a party of Musulman gentlemen, I was asked, in a confidential way, whether I had ever seen the *Phnew*: I spell the word with the almost undescribable nasal aspirate with which it was invariably pronounced to me. With an air of grave and serious interest, which is the best way of inspiring confidence, I replied, that the nature of the thing or being was unknown to me, and I requested information on the subject. On this there was a little hesitation, when, after a time, it was explained, that as I had seen more of Tigers than my companions, they fancied I might have also seen or heard something of the animal that always preceded the Tiger, called *Phnew*, from the ceaseless iteration of a sound similar to its name. I required further enlightenment as to this creature, when I found it was a "something that preceded the Tiger by six cubits, wherever he went, making the noise 'phnew' without end, looking for things for it." The old tales of "*the Lion and his provider*" recurred to me at once, and I bethought me of the hospitality of some cat-like sound of *Felis Tigris* having led, during his nightly search for prey, to the creation of the story. I have done all I could, but in vain, to discover whether there were real grounds for the belief, based on such a habit of the animal. I killed several Tigers in company with my friends afterwards, but though we found no *Phnew* with any of them, the silent faith of my believers in the marvellous has remained unshaken as to the existence of the mysterious animal. I subsequently learned that there is in Bengal a like belief respecting it among the Hindus, who term the creature *Ghóg* †.

There are few Englishmen in India who have not perhaps heard some of the strange tales related by the natives regarding Serpents. The most remarkable to me has always been the belief in the *Raj Samp*, or King-snake, who is represented as belonging to a superior order of Serpent, as exacting homage and obedience from his ophite subjects, and sometimes, as appearing with the semblance of a crown, the type of his authority. I was one day in company with a number

\* Extracted from the Journal As. Soc. Bengal for 1849. By Frederic Moore.

† According to Babu Rajendralál Mitra, the Hindus distinguish the *Ghóg* as a different animal from the *Phneu*.—Edw. Blyth, Esq.

of native gentlemen, when the conversation turned upon the nature of antidotes in the case of Snake-bites, the belief as to the cure effected by applying to the wound the head of the identical reptile that had inflicted it, the charms powerful to compel the Snake to appear,—as to all which matters I have never been able to obtain, amid many tales, any relator daring enough to declare himself an eye-witness of the marvels he recounted. At last, mention being made of the King-snake, a party present said—“At any rate I can assure you of the existence of *him*, for it is well known that I have seen,” and the story, to the following effect, was then told. The narrator, being at that time, he said, about fourteen years old, had run hastily to the terraced roof of a ground-floor house to recover his kite, when his attention was attracted by a large *Goomna* (Cobra capello) which, without perceiving him, raised itself with dilated hood in the erect attitude common with those Snakes, and uttered a loud cry. Immediately some ten or twelve Snakes appeared from different quarters, and assembled before their king, when, after a short time, he pounced upon and devoured one of the smaller ones, with which arbitrary assertion of regal power the convocation terminated. Now the narrator of this tale had no interest in attempting to mislead me; he had mentioned what he stated again and again to the majority of persons present for years before I ever saw him, and he is naturally of intelligence, and in no sort the man to tell a useless falsehood. It is, I was then informed, by these sort of assemblages that the King-snake asserts his power, and that his subjects are called to them for the purpose of bringing tribute, in the shape of dainties for the royal palate; should, however, no tributary Frog or Cat, or bird be forthcoming, or should even the offering produced be insufficient, one of the luckless ophids pays in person the penalty of the omission, even as had been witnessed by my informant. I ventured with respect to his story to object, in as delicate a way as I could, to the incident of the cry uttered by the King-snake, but in this I was immediately over-ridden. The cry of the large *Goomna* was well known in the ruinous city where we were, and in which they abound, and it was described to me as a strident sound, the attempted imitation of which resembled the acute *staccato* note of a treble hautboy. I heard this sound myself subsequently during a sleepless night, emitted by a large Snake which killed a Rat in my bed-room: as it was pitch dark, I was unable to rise and destroy the intruder, but the sound was too peculiar not to have been that of the ophid, according as it did with the description given me, and being unlike anything I ever heard before, as also contrasting distinctly and remarkably with the cries of its victim. I have noted down these trivial, but not incurious matters, as an inducement to the record of more valuable facts as to the opinions held by natives upon the habits of animals, whence perhaps some really useful information may be elicited.

Note by MR. BLYTH.

The Snake which I have had invariably pointed out to me as the *Raj-Samp* by natives of Bengal, is *Bungarus annularis*, which

habitually preys upon other Snakes, and is currently said to be a deadly enemy of the Cobra. I have taken a *Tropidonatus umbratus* about two-thirds the length of its devourer from the stomach of this species. Another ophiophagous species with the Cobra hood is *Hamadryas hannah* of Cantor, or *Maia vettata* of Elliot, a specimen of which, 9 feet long, I obtained in the Midnapore jungle.

Mr. Layard some time ago informed me of a popular notion among the natives of Ceylon respecting a "horn" which is said to grow sometimes, but very rarely, on the forehead of the Jackal; and this horn is regarded by them as a specific of innumerable virtues. Strange to say, the same notion is equally current among the natives of Bengal, who believe that it ensures the prosperity of its possessor, and success in every undertaking.

July 24, 1855.—Professor Tennant, F.G.S., in the Chair.

ON SOME NEW SPECIES OF BIRDS COLLECTED BY MR. M'GILLIVRAY. BY JOHN GOULD, F.R.S. ETC.

In exhibiting a portion of the first collection of birds which has been sent to this country by Mr. John M'Gillivray, the naturalist attached to H. M. surveying ship 'Herald,' Captain Denham, I have to remark, that it comprises several species of especial interest, particularly some obtained on the Isle of Pines, and on Lord Howe's Island. It also comprises a new form among the *Turdidæ* or Thrushes, from that isolated spot the island of Tristan d'Acunha, which presents a union of the characters of the genera *Turdus*, *Chamaea* and *Oreocincla*. This new bird I propose to characterize under the generic and specific appellations of *Nesocichla eremita*. Among the birds from Lord Howe's Island is a singular species of *Merula* or Blackbird, nearly allied in form to, but very different in colour from, the *Merula nestor* of Norfolk Island; to this species the specific name of *vinitincta* is assigned. From the same island are two distinct species of *Zosterops*, entirely new to science. They differ from any other species of the genus which has come under my notice, one of them being a very large bird for a *Zosterops*, and the other a much smaller species, being nearly allied to, but distinct from, the Australian *Zosterops dorsalis*: to these two species I give the names of *Z. strenuus* and *Z. tephropleurus*. A beautiful Parrakeet from Cape York, nearly allied to *Platycercus palliceps*, I propose to name *Platycercus cyanogenys*. Among the birds from the Isle of Pines is a very beautiful Pigeon, appertaining to the genus *Ptilinopus*. This bird, with several others of even greater interest, I propose to make the subjects of a second paper.

Genus NESOCICHLA.

Bill strong, more powerful than in the genus *Turdus*; gonys nearly straight, with a small notch near the tip in the upper mandible; culmen gradually descending from the base; nostrils seated in an oval depression at the base of the upper mandible; wings short,



somewhat concave; first primary very small; the third, fourth and fifth equal and the longest; tail rather shorter than in *Turdus*, and the feathers rather pointed; tarsi very strong, toes strong and much lengthened, particularly the hinder one; front of the tarsi scutellated; under part entire.

This form differs from all others in the great family of the Thrushes, and appears to partake of the characters of the genera *Turdus*, *Chamaea*, and *Oreocincla*.

#### NESOCICHLA EREMITA.

Head and all the upper surface, wings and tail dark sandy-brown, with a darker shade in the centre of each feather, but the primaries have paler edges, and the greater coverts and secondaries are tipped with sandy buff; lores and cheeks rufous; feathers of the under surface deep buff at the base, with a lengthened pear-shaped mark of brown down the apex of each feather, these marks being so large and thickly placed as to give the whole a mottley appearance; on the throat these marks somewhat resemble striæ; thighs buff; bill black; tarsi reddish-brown, toes darker.

Total length,  $8\frac{1}{2}$  inches; bill,  $1\frac{1}{4}$ ; wing,  $3\frac{3}{4}$ ; tail, 3; tarsi,  $1\frac{1}{2}$ .

*Hab.* The island of Tristan d'Acunha.

*Remark.*—This bird is about the size of the common Song-thrush, *Turdus musicus*, and similar to it in appearance; on examination, however, it will be found to differ very considerably in structure.

#### MERULA VINTINCTA.

The male has the head and nape blackish-brown, upper surface and wing-coverts reddish-brown; wings brown margined with olivaceous; tail brown; throat dark bluish grey; under surface vinaceous red; bill bright gamboge-yellow; eye-lash yellow; tarsi and toes yellow.

Total length, 8 inches; bill, 1; wing,  $4\frac{1}{8}$ ; tail,  $3\frac{3}{8}$ ; tarsi,  $1\frac{1}{4}$ .

The female is very similar, but is of a somewhat paler tint, and has only a trace of the black hood of the male.

*Hab.* Lord Howe's Island.

*Remark.* Of the same form, and somewhat allied to the *Merula nestor* of the Norfolk Island.

#### ZOSTEROPS TEPHROPLEURUS.

Head and upper surface bright olive-green, with a wash of grey across the shoulders; wings and tail slaty brown, margined with olive-green; throat dull yellow; around the eyes a circle of white feathers, below which is a mark of black; under surface pale vinaceous brown, becoming gradually paler on the lower part of the abdomen, and passing into the pale yellow of the under tail-coverts.

Total length,  $4\frac{3}{4}$  inches; bill,  $\frac{5}{8}$ ; wing,  $2\frac{3}{8}$ ; tail,  $2\frac{1}{8}$ ; tarsi  $\frac{3}{4}$ .

*Hab.* Lord Howe's Island.

*Remark.* This species is allied to *Z. dorsalis*, but is of a somewhat larger size, and is less richly coloured on the flanks.

**ZOSTEROPS STRENUUS.**

Head and upper surface bright olive-green, with a wash of dark grey across the shoulders; wings and tail slaty-brown, margined with greenish olive; eyes surrounded by the usual ring of white feathers, beneath which is a narrow line of black; chin and throat yellow; flanks pale vinaceous; centre of the abdomen nearly white; under tail-coverts pale yellow; bill and feet bluish black.

Total length,  $5\frac{3}{4}$  inches; bill, 1; wing,  $2\frac{3}{4}$ ; tail,  $2\frac{1}{4}$ ; tarsi,  $\frac{7}{8}$ .

*Hab.* Lord Howe's Island.

This is by far the largest species of the genus yet discovered.

**PLATYCERCUS CYANOGENYS.**

Crown of the head pale sulphur-yellow; cheeks cærulean blue; feathers of the nape, back and scapularies black, broadly margined with sulphur-yellow, stained with green on the lower part of the back; rump and upper tail-coverts greenish yellow, with an extremely narrow fringe of black at the tip of the feathers; shoulder and greater wing-coverts deep blue; lesser coverts black, bordered with deep blue; primaries and secondaries blackish brown, the basal half of their external webs deep blue, the apical half pale blue; tertiaries black, broadly margined with greenish yellow; breast pale greenish yellow, abdomen light greenish blue; all the feathers of the under surface slightly fringed with black; under tail-coverts scarlet, narrowly margined with yellow; two middle tail-feathers greenish blue; the next on each side blue, slightly tipped with pale blue; the remainder blackish brown at the base of their internal webs, and deep blue externally; their apical portions being beautiful pale blue.

Total length, 13 inches; wing,  $6\frac{1}{2}$ ; tail, 7; tarsi,  $\frac{3}{4}$ .

*Hab.* Cape York, north-east coast of Australia.

*Remark.* This species offers a very close alliance to *Platycercus palliceps*, but differs in having no trace of scarlet on the forehead, in the green tinge of the borderings of the feathers of the back, in the greenish yellow of the breast, and in having the cheeks blue instead of light yellow.

NOTES ON THE NESTS AND EGGS OF THE BIRDS OF WESTERN INDIA.—PART XI. BY LIEUT. BURGESS.

Family COLYMBIDÆ.

Genus PODICEPS.

PODICEPS PHILIPPENSIS.

I believe the egg sent with this paper to be that of the Grebe. It was taken from the nest with several others in the month of August. The nests were composed of rotten reeds and grass, fastened between tall reeds\*; each nest contained about eight eggs, 1 inch and nearly

\* The eggs were carefully covered over, and the heat arising from the nest was most perceptible: the eggs appear to be hatched by the heat arising from the decaying vegetable matter.

$\frac{5}{10}$ ths in length, by 1 inch in width. Some of the eggs were nearly white, others much discoloured.

Family PELECANIDÆ.

Subfamily LARIDÆ.

Genus STERNA.

Subgenus STERNA.

STERNA MELANOGASTER (Temm.). BLACK-BELLIED TERN.

I found this Tern common on the river Bheena, and was fortunate enough to obtain an egg. On a second occasion, when walking on a sand-bank in the midst of the river where I obtained the first egg, I was beset by a pair of these Terns, and on looking about on the ground, found two eggs deposited in a slight hollow scraped in the moist sand, not far from the brink of the water. These birds, when flying overhead, utter a cry very like the chirp of a Sparrow. One could easily distinguish the different kinds of Terns by their varied notes.

The Black-bellied Tern breeds during the months of March and April, laying two eggs. The egg measures 1 inch and rather more than  $\frac{2}{10}$ ths in length, by 1 inch in width. It is of a rich stone-colour, spotted chiefly round the centre, and more sparingly over the large end with grey and light brown spots.

Subgenus RHYNCHOPS.

RHYNCHOPS NIGRA.

This large species of Tern I found most abundant on the river Bheena, and had ample opportunities of studying its habits. On a large sand-bank in that river I found that a large colony had established themselves, and found young birds able to fly, nestlings and eggs. The appearance of these birds is attractive, their long orange razor-like beak, long wings, and curious skimming flight, ever and anon dipping their lower mandible under water, their odd shuffling gait when walking on the sand, as if they scarcely knew what to do with their beak, and apparent difficulty in arranging their long swift-like wings, their curious chattering notes when they assemble on some spit of sand at the water's edge,—all these points attract any one fond of natural history.

I first noticed these birds on a mud-bank in the river in the month of January. On visiting the same place in April, I found them on a sand-bank higher up, and suspecting this to be their breeding-time, was conveyed over the water to the bank. On reaching it and narrowly inspecting the ground, I found the remains of broken eggshells; after a further search, I was rewarded by finding four or five nests, also the nest of a Little Ringed Plover and Black-bellied Tern. The Rhynchops lays four eggs in a hole scraped in the damp sand and gravel. Those which I found were mostly near the water's edge. In some nests I found young ones, and procured one young bird that was able to fly very fairly. Any one at all accustomed to the habits of birds might have told that they were nesting

by their restlessness, and the vicious way in which they attacked all intruders. I saw them buffet a large Plover that pitched on the bank, and boldly attack those insatiable pilferers of nests, the Crows. The very young birds, when first hatched, are covered with a whitey-brown down, spotted with dark spots. The curious square end of the beak is very marked. The legs and feet of a dirty greyish-brown. The eggs are rather more than  $1\frac{1}{2}$  inch in length, by 1 inch and rather more than  $\frac{1}{10}$ th in width, of a pale stone colour, spotted and blotched with grey and two shades of brown.

I subjoin the description of a young bird that was able to fly, probably about six weeks or two months old. The beak (after the skin was dried) was of a dull brown tinged with orange; the under mandible sharp, as in the old bird, but scarcely longer than the upper. Feathers on the cheeks pale fawn colour, with a few dusky spots, those on the forehead much the same, but the dusky spots more visible; on the top of the head behind the eye, back of the neck, the feathers are dull black, with pale ferruginous edges; lower part of the back of the neck whitish, with a broad brown bar, and tipped with pale ferruginous; upper tail-coverts, some dusky black, with pale ferruginous edges, some ferruginous mottled with white; tail-feathers, lower portion white, upper portion dusky, with a marked border of pale ferruginous; primaries nearly black, with pale tips; smaller quill-feathers, lower portion dusky, upper nearly white; secondaries much the same, the white being much clearer; greater coverts dusky, with whitish tips; tertials dusky, with pale ferruginous edges; the lesser coverts the same; chin, throat, breast and belly, under tail-coverts white; sides of the neck white, with a few dusky spots; legs and feet dirty orange-brown.

ON SOME POINTS RELATING TO THE ANATOMY OF THE  
TASMANIAN WOLF (THYLACINUS) AND OF THE CAPE HUNTING  
DOG (LYCAON PICTUS). BY EDWARDS CRISP, M.D.

Before I proceed to the immediate object of my communication, I may be excused, I trust, for alluding to a mode of investigation that I have followed in all my dissections, viz. that of taking accurate weights and measures of the body of the animal and of the viscera, with drawings the size of life of the organs examined.

By this method, combined with the use of the microscope, I believe hereafter that much light will be thrown upon many physiological subjects which are at present but imperfectly understood. It is, however, only by comparison on a large scale that any important benefit is likely to result.

THYLACINUS CYNOCEPHALUS.

This animal (a male) died at the Society's Gardens, where it had been for several years. I believe it is the only one that has been dissected in this country. It weighed 33 lbs., and measured from nose to root of tail 2 feet  $9\frac{1}{2}$  inches. The tail, 15 inches. The penis curved backwards. The cause of its death was unapparent. It was

excessively fat; the fat on its abdomen and other parts weighing probably four or five pounds. The heart, long and pointed; weight, 4 oz. 60 grs. The trachea of moderate size; the connecting membrane at the posterior part very thick. The lungs trilobed; weight, 4 oz. 304 grs. The liver composed of five main lobes; weight, 14 oz. The spleen long, thin and narrow, with a lateral tongue-like process (as in nearly all of the *Marsupialia*)  $\frac{1}{3}$  from the upper end. Length of spleen,  $10\frac{1}{2}$  inches; its average breadth about an inch; it was seated along the left side of the stomach, imbedded in fat. The kidney of a rounded form; weight, 1 oz. 167 grs. The alimentary canal measured only 6 feet 6 inches. The stomach of moderate size; its coats very thick, and capable of great distension. The rugæ of the lining membrane large and prominent; the pyloric valve strong and muscular; the length of empty stomach 8 inches; the duodenum at its commencement studded with numerous bead-like processes, which emerged into a portion of mucous membrane thickly studded with villi about 3 lines in length, as represented in fig. 1. These were continued for nearly four feet; they resemble much the rumen of the sheep or rein-deer. In the small intestines of the Rhinoceros, fig. 2, the villi are about 6 or 8 lines in length, but far less numerous.

The cæcum absent. The large intestine measured 12 inches; the coats thick and the lining membrane plicated longitudinally. The relative weight of the viscera as compared with that of the body is about as follows:—Liver,  $\frac{1}{37}$ ; spleen,  $\frac{1}{382}$ ; kidney,  $\frac{1}{382}$ ; heart,  $\frac{1}{127}$ ; lungs,  $\frac{1}{112}$ ; the blood-corpuscles about  $\frac{1}{4500}$  of an inch in diameter.

Fig. 1.



Fig. 2.



I have examined the two skeletons of the *Thylacinus* at the Museum of the College of Surgeons, a description of which is given by Professor Owen in the new Osteological Catalogue (p. 347). The teeth, 46 in number; incisors, 8 above and 6 below; canines, 4; molars, 28, 14 in each jaw = 46. Vertebrae: cervical, 7; dorsal, 13; lumbar, 5; sacral, 2; caudal, 23; ribs, 13.

The time does not allow me to dwell on many points of great interest respecting the anatomy of this animal, but a comparison of the structure of the *Thylacinus* with the Dog I am about to describe will not be unprofitable.

#### CAPE HUNTING DOG (*LYCAON PICTUS*. S. Africa).

This animal died at the Society's Gardens, where it remained for some months previous to its death, a few days before which period

it had several convulsive fits. I could not examine the brain; but Mr. Ward, who stuffed the animal, told me that a large quantity of serum escaped from the cranium, so that probably death was occasioned by inflammation of the brain and effusion of fluid.

In Cuvier's 'Animal Kingdom,' 1849, by Carpenter, p. 91, is the following note:—"This remarkable species is dog-like, but certainly not a *Canis*; its form and colouring (and, there is reason to suspect, its internal conformation) are rather those of a hyæna, and it is known to copulate in the manner of those animals, and not in the peculiar manner of the dogs and foxes. Even its dentition is the same as that elsewhere found (with one other exception, *Proteles*) throughout the group to which we conceive the hyænas to belong, the dental system of which latter appears to be modified in accordance with their much increased and prodigious strength of the jaw."

This dog weighed about 50 lbs.; it measured 3 feet 1 inch from nose to root of tail; tail, 13 inches; height to the back behind neck, 2 feet 3 inches; fore-leg,  $16\frac{1}{2}$  inches; ribs, 13. Teeth: incisors, 6 in each jaw, 12; canines, 4; molars, 10 above and 12 below, =38. The age of the animal about  $2\frac{1}{2}$  years. Heart of a rounded form; weight 8 oz.; the parietes of the left ventricle 10 lines in thickness, of the right 3 lines; the aorta of large calibre, and its coats thick. Lungs, the right four-lobed, the left three-; weight 26 oz. Trachea very large. Liver seven-lobed; weight 21 oz. Bile of a dark yellow colour. Gall-bladder of moderate size. Spleen about 500 grs. in weight; long, lax, thin and narrow, as in all the *Carnaria*. It was in the usual situation in this order of animals, viz. on the left of the stomach, to which it was attached by a wide mesenteric fold; the splenic artery and vein long; no valves in the latter. Pancreas small and elongated. Kidney oblong, less concave on its inner side than usual. The stomach of moderate size, and shaped like that of the dog; length 12 inches; this organ with the œsophagus measured 12 feet 6 inches; the cæcum, which was in  $2\frac{1}{2}$  spiral folds like that of the dog, when unfolded was 5 inches in length; the colon and rectum 1 foot 10 inches; total, 14 feet 9 inches. The cæcal valve strong and distinct. The alimentary canal was too much decomposed to allow of my making a microscopical examination of it, but its structure appeared to resemble that of the Dog.

The ribs of the Hyæna are 15; those of the *Lycaon* 13, as in the Dog, Wolf and Fox. The teeth of the Hyæna, judging from two skulls in the Museum of the College of Surgeons, are, 4 incisors above, 6 below, 10 molars above, 12 below, canines 4, =36. In the skull of the Striped Hyæna 10 molars in each jaw (one specimen), and in some fossil jaws of this animal the number of molars is less than above quoted; but much, of course, will depend upon the age of the animal. In the Pointer, Blood-hound, Dingo, and other dogs, I found 12 molars above and 14 below, the canines being 4 and the incisors 12. The same with the Wolf and Fox.

The only record I can find of the dissection of a Hyæna is one furnished me by Professor Quekett, and in this animal (30 years old)

the alimentary canal measured 39 feet 5½ inches. The account is copied from Professor Quekett's notes. I was at first inclined to suppose that the copyist had made some mistake, the length mentioned being very great for a carnivorous animal. Professor Quekett suggested "that the large quantity of phosphate of lime taken by the hyæna might explain the anomaly."

On referring, however, to the notes of my dissections of four dogs, in which I carefully measured the alimentary canal of all, the above statement does not appear to be so improbable:—

Small Terrier, alimentary canal 7 feet 4 inches.

Small Terrier (young), 7 feet.

Blood-hound, 21 feet; including large intestines, 2 feet 2 inches.

Large Mastiff (old), weighing 104 lbs., 31 feet; including large intestines, 3 feet.

Common Fox, 10 feet 6 inches.

Young Indian Wolf (four months old), 6 feet 1 inch.

So that, looking to the ribs, teeth, cæcum, length of alimentary canal, and general form of the viscera, this animal must be classed with the Dogs, and not with the Hyænas.

#### *Additional Remarks on the Lycaon pictus.*

After the death of the dog, the bitch which was with him became restless, howled frequently, refused her food, and died July 13th, ten days after.

I examined the body a few hours after death. She was about the same size as the dog, and of the same age. She had probably lost 10 or 15 lbs. in weight. The body weighed 31½ lbs., and the subjoined is the relative weight of the viscera, fractions being omitted:—

Heart, 7 oz.  $\frac{1}{7\frac{1}{2}}$ .

Lungs, 24 oz.  $\frac{1}{21}$ .

Liver, 18 oz.  $\frac{1}{8}$ .

Spleen, 790 grs.  $\frac{1}{280}$ .

Pancreas, 370 grs.  $\frac{1}{99}$ .

Kidney, 1080 grs.  $\frac{1}{205}$ .

Alimentary canal, 13 feet 6 inches.

The uterus resembled that of the bitch (*C. familiaris*); the vagina 9 inches in length, the cornua 6 inches each.

But one of the most interesting results of this dissection was the examination of the blood-corpuscles; these were larger than in any carnivorous animal that I have dissected; they measured, the greater part of those examined, about the 3000th of an inch in diameter, being larger than those of Man.

I may add, that I could not discover any morbid lesion in this animal, and that I believe her death was occasioned by the loss of her companion.